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THE FUTURE OF THE TORPEDO IN WAR.

BY ADMIRAL P. H. COLOMB, ROYAL NAVY.

SOME little time back* I wrote for this REVIEW a forecast of the future of the warship. Balancing, as I then did, amongst the various facts before me, I concluded that changes in motive powers and weapons were ostensibly the modifying forces at work, but that while the experience of the past was the best guide in dealing with their probable action, that taught us that mere fashion, the mere feeling of any time, was liable to outweigh the pure reason of problems and to assert itself. This fashion is, however, never supreme, because it is always uncertain in its action; and if a new weapon, or a new development of an existing weapon, appears in a striking light, fashion will often join hands with the apparent reason of the thing, and create sudden and almost revolutionary changes. Matters being in this condition, he who would forecast approaching changes must ever keep his eyes open to any new combination that arises, and must endeavor to regard its influence both from the reasonable and, if the word be permissible here, from the fashionable standpoint. I am going to take a view of the near future of the torpedo, which is comparatively new to my own mind, and may perhaps present subject-matter for new thought to those who pursue their business in the great waters of speculation as to naval war.

I seem to see that, by a series of apparently disjointed side issues, greatly influenced by the fashion of the moment, we are approaching an issue graver than any we have yet encountered since steam began to trouble the sublime repose of the old naval mind. I begin, with something of a startled feeling, to foresee the recrudescence of an idea widely spread ten years ago on the Continent, but since suppressed by the weight of indubitable

* October, 1893.

fact. I begin to wonder whether the conditions are not altering so fast that the facts hostile to the idea are not being lifted off it, and whether it will not spring up again, no longer as a fashion of thinking, but as a question that must be seriously met.

We have to group together a series of new conditions independently developed without any view to a general conclusion, and we have to see whether, when they are so grouped, a tremendous and unexpected conclusion will not present itself. The conditions are entirely indisputable. They are : the great increase which has been recently given to the power, accuracy, speed, and range of the torpedo ; the sudden rise of a large group of vessels which are named and being built as "torpedo-boat destroyers," which have an astonishing speed, and which are in reality a most powerful class of torpedo vessels ; and lastly, the great size and cost of the latest battleships.

The torpedo was at first introduced as an auxiliary weapon in large warships. It represented a gun of immense power, but of very short range, and of inaccurate trajectory. It was a sort of glorified carronade, where the greater destructiveness was balanced by the shortness of its range and its bad shooting ; and it was possible to debate over its real value on somewhat the same lines as those on which our forefathers debated over the large-calibered short-range carronade, compared with the small-calibered great range "long" gun. About the terrible power of the torpedo when exploded against a ship's bottom there was never any doubt. It would open a chasm through which one might—to use the familiar simile—drive a coach and horses. Even when the charge of gun-cotton in the head of the torpedo was only 60 pounds, which was the case ten years ago, it was but barely possible by interior arrangements of air spaces and coal barriers to restrict the inflow of water, after such a catastrophe, to quantities short of being fatal. But now, when the 18-inch torpedo carries 190 pounds of gun-cotton, I suppose that all hopes of such special defences must be abandoned. If a ship does not quickly sink after such a blow, it will be by favor of the multicellular system of construction, which, in the cases of the *Howe* and the *Victoria*, have recently and sadly disappointed us. A short time ago a system of strong wire netting, extended by spars thirty feet from the hull, was supposed to offer fair protection from the blow of a torpedo to a ship at anchor. This appears to be all over. Tor-

pedoes can be furnished with instruments which enable them to cut their way through any netting without premature explosion, and afterwards to explode against the ship's bottom.

If the torpedo had been restricted to the position of an auxiliary weapon in the battleship, it could scarcely have had more effect on construction than to keep down the size of the ships so as to diminish the total risk, and, on tactics, than to keep fleets far apart in battle, each side trusting that it might win with the gun only. Undoubtedly neither side would at first care to run tremendous risks that they could not control, and which were quite as likely to be against them as against their adversary. The exception would be that the originally weaker force, or the force which was finding itself being beaten in the gun fight, might turn to the torpedo in a desperate hope. The commander of such a force might argue that he could not be worse off than he was, and that the chances—perhaps the even chances—of the torpedo might enable him to sell the victory dearly if he did not win it. But in this case the superior or winning force would strain every nerve to avoid a torpedo battle.

But almost from the first it was seen that an ordinary steam pinnace, carrying a torpedo on each side ready for launching, was a full match for the most powerful and costly warship ever heard of, if only she could get within the 200 or 300 yards of her which limited effective torpedo range. The American Civil War had familiarised the naval world with ideas of secret and silent night attacks using explosives against the sides of too secure and careless adversaries. The locomotive torpedo offered an almost infinite field for this sort of warlike ingenuity and daring, and the thoughts of all were full of it. There is some difficulty in tracing exactly the connection of ideas between this particular form of attack, and the construction of light and fragile vessels of very high speed to carry it out. I do not recall clearly whether any reasoned demand for such a vessel as the *Lightning* was the cause of her construction, or whether, being constructed on an outside and instinctive view of the situation, she became the cause, and not the effect, of naval views. Here she was, however, as far back as 1877, only three or four years after the torpedo itself had secured a position. She was fragile in hull beyond the dreams of naval architecture. Displacing 27 tons, and being 84 feet in length, she was too large to be called a

boat and too small to be called a ship ; but she could discharge a missile capable of destroying any ship afloat at a blow, and she possessed the then enormous speed of 19 knots an hour.

What did she mean exactly ? Did she mean the same to the dominant naval nation as to such as were sub-dominant ? Was she a threat to British naval power, or did she enhance it ? How was British naval power going to fit her into its policy and programme ? The new vessel had certain disabilities. She was scarcely sea-going. She was certainly not sea-keeping. To use a phrase which her type gave rise to, but which it is an anachronism to employ as respecting her alone, her "radius of action" was short ; she could not operate at any great distance from her mother-port. But for sub-dominant nations the role of the *Lightning* type was clearer. Costing a mere trifle, exposing to hazard the lives of not more than a dozen or 15 men, and yet being a solid threat against the life of a battleship costing half a million of money, and against the lives of the five or six hundred men embarked in her, the new vessel was eminently qualified to prevent the blockade of her mother-port, and to compel all ordinary warships of the enemy to keep their distance. All the Continental nations forthwith began to build multitudes of improved *Lightnings*. They were generally larger, with greater speed, and with longer radii of action as a consequence of improved coal supply and economy of consumption. Their force was also increased by additional torpedo tubes and a larger reserve of torpedoes.

Not altogether willingly, England in 1878-9 built a few improved *Lightnings*. Ripening opinion claimed that long before she could be driven to employ the new torpedo-boats to raise the blockade of her home ports, she must have been on her knees, suing for an ignominious peace. But granting—which was not so easy—that high speed was necessary for the success of secret and silent night attacks upon enemy's ships within their ports, England thought that she found a more congruous outlet for the new idea, in building smaller *Lightnings* which she called "Second Class torpedo-boats." These were only 60 feet long, they weighed only 15 tons, they steamed only 15 or 16 knots, but they carried 2 torpedo tubes and could be hoisted into the battle-ships like any other boats, carried thus off the enemy's ports, hoisted out and sent in on their destructive errands on the blackest and therefore most suitable of nights.

As to the original connection of high speed and torpedo night attack, I have observed that it was not obvious, and perhaps rested more upon fashion than upon argument. The last thing that anyone would do who proposed to attack a ship in a torpedo boat under cover of darkness would be to approach her at speed. The noise of the engines and of the rush of water might make her approach audible; the flame from the short funnel, which always showed itself when a boat was at speed, as well as the white foam at the bow, would certainly make her approach visible. Such an advance upon the enemy put an end to all ideas of secrecy and surprise. Reasonably, the great speed of the torpedo boat in a night attack could only come into play either in a desperate rush in after premature discovery, or in a frantic flight after the discharge of a torpedo within distance. But still there is an unreasoned feeling drawing together the ideas of extreme daring and extreme speed which may have been the original promoter of the torpedo-boat ideal. But now that the first and second class boats with those exceptionally high speeds existed, and rôles for each class were found, the *raison d'être* of the latter began to establish itself. For the second-class boat, hoisted out, it might be, at a distance from the port she was about to attack, a speedy run in was necessary if the work was to be done in possibly short hours of darkness. She might require her highest speed to run in, though she might drop to her lowest on drawing more near to her quarry. For the first-class torpedo boat, issuing from port to threaten and drive off a blockading fleet of battleships or cruisers, the highest speed was a mere necessity. Such a threatened fleet or squadron would never dare to rest and await the attack of foes as insignificant as they were deadly. There was but one thing to be done, namely, for the warships to turn their sterns to the torpedo boats and, while thus flying at their highest speed, to pour from their sterns the heaviest possible stream of comparatively light missiles, every one of which would be effective on the fragile hull or on the exposed crew of a torpedo-boat, if it struck. The pursued would desire, by superior speed, to keep the pursuers under fire till either its physical effect put them *hors de combat*, or its moral effect destroyed the will to advance. The pursuers, on their side, would in any case desire to press the speed, because the further they drove the enemy in any given

time, the better for the opening of the port behind them ; while, if they could actually reach torpedo-range before the ship's fire could check them, their highest aim would be achieved ; they would fight, and perhaps win, a torpedo battle.

The building and improvement of the first-class torpedo boats went on ; lavishly on the Continent, grudgingly and intermittently in England, though she found a place for some of them as defenders of her distant outlying war ports. The nominally vast superiority of the speed of the boat over that of the ship maintained itself, and it was scarcely possible that the picture painted above, of a fleet of battleships driven to fly before a group of mere wasps, should not be developed. If men were brave enough to press on their torpedo-boats in such a pursuit at night-time, and if it was uncertain whether or not they might win in the course of it, was it so impossible to do the same thing in broad daylight ? Great numbers of these boats could be assembled for such a concentrated attack. The money risk and the life risk would be as nothing to that involved in assembling the orthodox fleet. Were heavy war-ships doomed from henceforth never to approach an enemy's port with hostile intentions ? But, if this were so, would the area of operations be limited to the immediate vicinity of ports ? The sea-going and sea-keeping qualities of the torpedo-boat were being continually improved. The theatre of European naval war was, after all, restricted. Could not torpedo-boats take and hold the command of it ? Then followed a thought delightful to those of our Continental neighbors who, for one reason or another, desired that British predominance at sea should determine. Several writers showed how, by a series of hypothetical cases, the British fleet must utterly disappear before the attacks of the Continental torpedo-boats. It was not suggested that two could play at the game. England was to stick to her orthodox fleets and lose ; Continental powers were to adopt the heterodox torpedo-boat flotillas and win.

Experiment, consideration, and a more practical acquaintance with the tricks and manners of the first-class torpedo-boat checked these extreme ideas. It was found that the fire of the machine gun, when tried upon the hull of a dummy torpedo-boat, had such a severe effect that no boat and no men could be expected to sustain it for any time. It was found that the

sea speed and the measured mile speed of the boat differed considerably. Comparatively slow vessels at sea could gain upon torpedo-boats; nominally swift torpedo-boats made no hand at catching up the orthodox warship. French admirals taking torpedo-boats to sea with them as a presumed necessary adjunct of their battle-fleet, found they were of more trouble than they were worth, and sent them ignominiously home again. Worse indeed than this. The French found that a considerable class of their torpedo-boats could not discharge a torpedo at all when they were steaming against a sea.

So far, then, as operations in the open sea were concerned, the torpedo boat, and the torpedo with her, fell back some paces to her first position, while it was made evident that she must be improved even to hold the position of a preventer of blockade. She must be made more capable of retaining her speed in a sea-way; she must not fail in the discharge of her torpedo while at speed in a high sea. France and other nations, but France especially, proceeded with the building of a larger class of torpedo boats, which became first class, while she relegated all the earlier boats to a lower status. She also began to build what she called sea-going torpedo boats. They weighed perhaps 150 tons, they were 140 or 150 feet long, they started with a speed of 20 knots, which was running up to 25, they carried three or four torpedo tubes and a gun armament of two or three three-pounders, they accommodated crews of 25 or 30 men, and were perhaps sea-keeping as well as sea-going vessels. At any rate they were intended to take that position, as opposed to the enemy's battleships, which their forerunners had failed to take.

In England it was impossible to ignore the position created for her by the possibly hostile swarms of torpedo-boats, especially by those immediately across the channel. If these torpedo-boats were efficient for operating against ships in the vicinity of their ports, was it not clear that if they had coal enough they could cross the channel and operate with much more certainty at night against our ships in the home roadsteads and accessible ports? A strong section of naval men fixed their minds steadily on the conception that, if nothing was done to hinder it, the outbreak of war between France and England would be heralded by a tremendous rush of French torpedo-boats across the channel, and a vast destruction of British warships in port on the night after

the declaration of war. There was reason in it. No southern British port was beyond the radius of action of the French torpedo-boats, and France fostered the English feeling by establishing all along her channel coast special torpedo-boat stations in which issuing boats left nothing behind them requiring defence, and could therefore only issue for purposes of attack. And then there was another point. If these torpedo boats were capable of preventing close blockade of enemy's ports, they opened the door for the issue of commerce destroyers, and they might themselves become commerce destroyers. What would be the British position then ?

It was felt that the situation was really serious. There were strong comments by the public, but not by the naval public, on the meagre show of British first-class torpedo boats as compared with the Continental swarms. But the authorities, and most of the experts, felt strongly that the ordinary first-class torpedo boat was not an answer to her fellow across the water. Looking at the double necessity of blockade, a class of sea-keeping vessel was required by England, which might, by her small size, minimize the dangers of torpedo attack ; might by the character of her gun-armament be a strong, if not a conclusive, threat to the torpedo boat proper ; and might herself carry such a torpedo armament as would make her even more efficient for that kind of attack than an ordinary torpedo boat. It was essential that such vessels should have high speed.

The result of these cogitations was the production in 1886-7 of the first of the so-called "torpedo-gun-boats," the *Rattlesnake*, *Grasshopper*, *Sandfly* and *Spider*. These were vessels of 525 tons, 200 feet long, intended to steam 19 knots with coal enough to carry them 2,400 miles at 10 knots. Their gun armament was 1 4-in. gun and 6 3-pounders, and they had 2 torpedo tubes. Being considered not wholly successful after trial, supposed improvements were made in the nine vessels of the *Sharpshooter* class, launched in 1888-9. These ships were rather larger, intended to be rather faster, with an armament altered in the direction of increased number of heavier with decreased number of lighter guns of reduced calibre, and considerable increase of torpedo power. It is not exactly clear to one who has nothing to say to the initiation of these things, why the next group of vessels, embodying the same ideas, and apparently designed to fulfil

the same functions, should have been simply larger than the last group. But while the *Sharpshooter* class were of 735 tons, the 11 ships of the *Jason* class, produced in 1892-3, were 810 tons, with the same torpedo and gun armament as their predecessors, and with at least no greater speed. It is said that the last result is simply a boiler failure, but we are not concerned to debate the question, as the five ships of the *Dryad* class now built and building have followed up the increase in size to 1,070 tons without increase of speed, though with some increase in coal capacity and weight of metal, balanced by a reduction in torpedo power.

Judging from the characteristics of these vessels, their rôle was especially that of the blockaders of enemy's ports. They might draw off to sea in the daytime, and close in at night, making their torpedoes an effective threat against the issue of battleships and cruisers, while their guns—especially their lighter ones—might be held an effective threat against the issue of torpedo boats. Though there are anomalies in these vessels that I cannot explain, and though I fail to understand how it has come to pass—unless fashion put her hand in—that we have doubled the size of them since we began; yet I think they would go far towards filling their place in war if they should be unhappily ever put to it. They have never been tried as blockaders, but it must be admitted that, as opposed to torpedo boats in the open sea, general, and especially torpedo-expert, opinion has strongly condemned them. They have not shown the speed for successful pursuit of the first-class torpedo boat; the commanders of torpedo-boats which have encountered them in mimic war despise the power of their armament. But on this point it must be said that all over the naval world, commanders of torpedo-boats have always despised the gunfire of their orthodox adversaries. In every encounter the torpedo-boat claims to win, and rejects with scorn the equally strong claim of the battleship or cruiser to have destroyed her.

We must note that none of these torpedo-gunboats has been designed to attack battleships in open fight. That idea is in England, and perhaps always has been, unauthoritative. The vessels took up the popular title of "torpedo-catchers," as the short for "torpedo-boat catchers," and are condemned only because it is believed they cannot catch torpedo-boats. It is scarcely noted of them that in fulfilling their function of blockaders, it is

more a question of whether the enemy's torpedo-boats would attempt to run past them, than whether they were competent to catch the boats after they had run past. But these are points we have not space to enter into; what we have to note is that these vessels are defensive, not offensive, like the French sea-going torpedo boats, and that they do not influence the tactical question so far.

But all the torpedo-boat experts in England became distinctly bitter against the whole tribe of these torpedo-gunboats. There was a loud expert outcry in the press which seemed to declare that the torpedo-boat was the only answer to the torpedo-boat, and to swell the demand of the inexpert public that our ports should swarm with torpedo-boats as those of France did. It now appears that this was not the real demand; but yielding to it, the Government of 1892-3 promised 10 first-class torpedo-boats of superior size, speed, and power; boats of 140 feet in length, of 130 tons displacement, and of 23 or 24 knots speed. But this was still not exactly what was wanted. Counsels not disclosed to the public were given and accepted, and in the estimates of 1893-4 an entirely new type was promised, to be called "torpedo-boat destroyers," with a guaranteed speed of no less than 27 knots. The first of the new class, the *Havock*, was tried a few months ago, and reached 26.78 knots speed; the second, the *Hornet*, was tried last February, and steamed 28 knots; the third, the *Daring*, tried only the other day, ran on the 23d of June at the astonishing speed of 29.3 knots, the speed, it has been said, of an ordinary railway train.

These vessels are 180 feet long, and displace 220 tons; they have fair accommodation for 42 men, and they cost about £35,000 apiece. Forty-two of them have been ordered. What strikes me about them most of all, after their astonishing swiftness, is the fact that though called "torpedo-boat destroyers," they are more distinctly torpedo-boats, pure and simple, than anything yet seen. They are to have 5 torpedo tubes, while their gun armament is not significant. They carry one 12-pounder and three 6-pounders, with a possibility of mounting two more of the latter. But five torpedo-tubes on a displacement of 220 tons assuredly means torpedo warfare, and not anti-torpedo-boat warfare; and the fact brings us face to face with the *denouement*, all undesignated, as I believe it to be.

We have seen how some ten years ago the idea of the torpedo-boat becoming the master of the battleship took root, flourished, and withered. We know that it withered not because of inherent absurdity, but because the torpedo-boat of that day was really neither sea-going nor sea-keeping, and above all had not sufficient speed to enable her to make sure of closing on a battleship or cruiser quickly enough to run safely through the storm of her gun-fire. The class of torpedo-boats being built abroad has been such as to get over these disabilities, and apparently our new class of torpedo-boat destroyers, already being followed up on the Continent, seems to place them out of question. What, then, is to prevent the successful attack—even in broad daylight—of these new torpedo-boats on battleships?

If our torpedo-boat commanders are right, the gun-fire of battleships is less to be feared than was supposed. In any case it is a question—for the open attack—of speed of approach. When the question was mooted before, the stern fight which the battleship was to offer was expected to either prevent all advance of torpedo boats, or else to make it so slow that the guns would have the best of it. But now we have the torpedo boat in all ordinary weather probably with an excess of speed over our fastest battleships of perhaps ten knots, over others of fourteen knots. Gun-fire cannot be very effective over 2,000 yards at sea. If the torpedo-boat destroyers can maintain their speed as well as the fastest battleships at sea, then they can, in pursuing a battle fleet, run through its fire, and be amongst it in six minutes. Should such a fleet contain within it a fourteen-knot ship, and be unwilling to abandon her, then the torpedo boats will run through the fire of the ships in perhaps $4\frac{1}{4}$ minutes. But the boats would not require to run close up. They would be more likely to manœuvre so as to surround a battle fleet and to take up positions in advance of it, all beyond effective gun-fire range. The closing in to perhaps 400 yards or so would then be much more rapid and therefore much more secure for the torpedo boats. It is not easy to see why such attacks should not be made; it is most difficult to see how battleships could guard against them.

We must remember what an immense target the most modern battleship now offers to the torpedo. An underwater area of 390 feet by 27 feet ought to be easy to hit at 400 yards even

allowing for all difficulties in estimating speeds. But a torpedo set for 800 yards and fired into a group of battleships is like a shot into a covey of partridges. If one is not hit, another may be. Then we must note the enormous disadvantage under which a battle fleet lies in point of cost and exposure of life when compared with a torpedo-boat flotilla. In cost the battleship must be 24 to 1, in exposure of life from 12 to 15 to 1. How could a 17½-knot *Magnificent* deal with twelve 28-knot *Darings*?

These are striking and startling antitheses, yet a more striking point remains. In the very strength and height of the cry for battleships, the British navy has given them up, and had done so even before these astonishing feats of speed had been performed. There had long been a vague sort of feeling that the British battleship was not able to protect herself, but Commander Sturdee, in his prize essay on naval tactics, has nowhere been attacked for laying it down that every battleship must henceforth be accompanied by a torpedo boat-destroyer "to protect her."

We have, therefore, dropped from the clouds into a staggering position on the sea. We could not possibly have meant it, or we should have held our hand over the production of battleships in such an insecure position. If our battle-fleets are open to the sort of attack we have described, and if they are incapable of withstanding it, will an enemy make any other sort of attack? But if our battleships are not going to meet battleships, what is the use of sending them to sea? Note what a series of knock-down blows we receive when we contemplate the conditions of tactics set out. We are to send a battle fleet to sea in order at least to keep the enemy's battle fleet in port. But we are so sure that the enemy can beat our battle fleet without using a single battleship, that we are going to send out a second fleet of torpedo-boat-destroyers to take care of the first fleet of battleships. But surely if it is the enemy's torpedo boats that we fear, there is no object in sending the first fleet to sea at all. If we kept the battle fleet in port, dismantled, and only sent the torpedo flotilla to sea, the enemy's battle fleet will never quit port to expose itself to destruction by a flotilla we all admit it cannot face. It is our torpedo flotilla that is holding the command of the sea, and the enemy must fit out an anti-torpedo flotilla—which we admit the battle fleet is not—in order to beat it.

I cannot as yet sound the depths of these staggering considerations. I can understand how, in land war, infantry may be employed to protect artillery without placing artillery in the position of a useless arm. But I cannot yet see how the torpedo-boat destroyer can be necessary to protect the battleship, and yet have the latter as a necessary arm. Battle fleets are not necessary elements of an army, such as batteries of artillery are. They are the army itself. If one side brings a force of battleships and torpedo-boat destroyers into the field because of the admitted weakness of the former, I cannot conceive an enemy also bringing the weaker element of force into the field. It seems to me he is compelled to endeavor by superiority of torpedo-boat destroyers to first beat those of the enemy, and then to defeat the unprotected battle fleet with his victorious torpedo flotilla. Such are the issues raised by the trials of the *Daring*. I think I am right in calling them momentous.

P. H. COLOMB.